Following are some guidelines or rules for drawing Chen Entity Relationship Diagrams (ERDs) and Crows Foot ERDs in this class. It is expected that you follow these guidelines for all diagrams drawn in this class:

**CHEN ERDS:**

- No color on diagrams (black and white only)
- All entity names should be singular nouns and should be in all capital letters in the shape of rectangles on diagram (i.e., CLASS, COURSE, STUDENT)
- A strong entity is shown as a solid-lined rectangle while a weak entity is shown as a double-lined rectangle on the diagram
- All relationship names should be verbs or verb phrases and should be in all lower case letters in the shape of diamonds on lines between entities on diagram (i.e., generates, is found in, has, etc.). No relationships exist between composite entities and the entities they connect to.
- All attribute names should be in Camel Case (or use words with underscores as alternative [i.e., First_Name or FirstName, Last_Name or LastName, or StuDOB or StuDOB, etc.]) and should be singular and in the shape of ellipses with a solid dedicated line going from the ellipse to entity rectangle edge
- Primary keys (PKs) should be underlined (solid line) on diagram (each entity should have at least one PK)
- Foreign keys (FKs) should be either dot-underlined or italicized or both on diagram (all entities do NOT have to have a FK)
- All connectivities need to be represented on diagram and need to be 1,1 or 1,M or N,M to represent one-to-one, one-to-many or many-to-many relationships
- All cardinalities¹ need to be represented on diagram and need to be in parentheses () next to the entity they apply to, with a minimum number and maximum number [i.e., (1,N), (1,5), (0,3), etc.]
- All applicable optionalities need to be represented on diagram and need to be shown at the optional entity end, next to the rectangle’s edge, with a circle (O)
- All bridge or composite or associative entities should be represented on diagram as a singular noun and should be in all capital letters in the shape of a rectangle with a diamond inside of it (a bridge or composite entity is added between two other entities that are in a M:N relationship since we cannot implement M:N relationships)
- Any derived attributes or calculated field attributes should be represented on the diagram as dotted line ellipses or dotted lines going from ellipse to entity

Please click HERE for a Chen Diagram ERD example. Click HERE for a more in-depth discussion on how to map a relational diagram or schema to an erd (an example) using both Chen and Crows Foot diagrams and detailing connectivities and cardinalities.

¹ For this class, all cardinalities (for both the Chen and Crows Foot models) should be placed next to the entity to which it applies (the textbook reverses this for the Chen Model but we will treat them both the same for this class).
CROW’S FOOT ERDS:

- No color on diagrams (black and white only)
- All entity names should be singular nouns and should be in all capital letters in the top portion of the square box on diagram (i.e., CLASS, COURSE, STUDENT)
- A dotted line between entities on diagram represents a weak relationship while a solid line between entities on diagram represents a strong relationship
- All relationship names should be verbs or verb phrases and should be in all lower case letters and should appear just above line connecting entities on diagram (i.e., generates, is found in, has, etc.).
- All attribute names should be in Camel Case (or use words with underscores as alternative [i.e., First_Name or FirstName, Last_Name or LastName, StuDOB or StuDOB, etc.]) and should be singular and should be unbolded if not required or derived (should be bolded if required)
- Primary keys (PKs) should be bolded and underlined and labeled as such using “PK” symbol in left portion of box on diagram next to attribute name (each entity should have at least one PK)
- Foreign keys (FKs) should be labeled as such using “FK1”, “FK2”, etc. symbol in left portion of box on diagram next to attribute name (all entities do NOT have to have a FK)
- All connectivities need to be represented on diagram and need to be 1,1 or 1,M to represent one-to-one or one-to-many relationships (using 2 vertical lines for 1-to-1 (||), one vertical line and crow’s foot for 1-to-M (>| ), and a circle and crow’s foot for 0-to-M ( >Ô )
- All cardinalities\(^2\) need to be represented on diagram and need to be in parentheses () next to the entity they apply to, with a minimum number and maximum number [i.e., (1,N), (1,5), (0,3), etc.]
- All applicable optionalities need to be represented on diagram and need to be shown at the optional entity end, next to the rectangle’s edge, with a circle ( Ô )
- There is no special way to designate a bridge or composite or associative entity in a Crow’s Foot Diagram
- Any derived attributes or calculated field attributes should be represented on the diagram as italicized names

Please click HERE for a Crows Foot Diagram ERD example. Click HERE for a more in-depth discussion on how to map a relational diagram or schema to an erd (an example) using both Chen and Crows Foot diagrams and detailing connectivities and cardinalities.

PLEASE make sure you download the Visio Professional 2010, and not 2013 as there are some features used in 2010 that are not readily available in 2013.

\(^2\) For this class, all cardinalities (for both the Chen and Crows Foot models) should be placed next to the entity to which it applies (the textbook reverses this for the Chen Model but we will treat them both the same for this class).